

In the Specification:

On page 1, after the title insert the following:

RELATED APPLICATIONS

This is a U.S. national stage of application No. PCT/DE2003/001831, filed on 4 June 2003.

This patent application claims the priority of German patent application nos. 102 28 634.5 filed 26 June 2002, the disclosure content of which is hereby incorporated by reference.

FIELD OF THE INVENTION

On page 1, before line 14, insert the following heading:

BACKGROUND OF THE INVENTION

On page 1, before line 28, insert the following heading:

SUMMARY OF THE INVENTION

On page 1, amend the paragraph beginning on line 28 as follows:

The One object of the present invention is ~~based on the object of providing to~~ provide a surface-mountable miniature luminescent diode and/or photodiode of the type stated at the beginning which allows further reduction of its overall size.

Delete the paragraph beginning on page 1, line 34 through page 2, line 3 in its entirety.

On page 2, amend the paragraph beginning on line 5 as follows:

~~According to the invention, it is provided in the case of a surface mountable~~
~~miniature luminescent diode and/or photodiode of the generic type that the leadframe is~~
~~formed by a flexible multi-layered sheet. This and other objects are attained in~~
accordance with one aspect of the present invention directed to a surface-mountable
miniature luminescent diode and/or photodiode with a chip package which has a
leadframe (16), and a semiconductor chip (22) which is arranged on the leadframe (16)
and is in electrical contact with it and which contains an active, radiation-emitting and/or
radiation-receiving region, wherein the leadframe (16) is formed by a flexible multi-
layered sheet (12, 14).

The invention is therefore aimed at ~~based on the idea of~~ creating a luminescent diode and/or photodiode of a small footprint which can be produced with a high packing density, and consequently with low production costs, by mounting the radiation-generating and/or radiation-receiving semiconductor chip on a flexible leadframe.

On page 3, amend the paragraph beginning on line 32, as follows:

The invention offers particularly great advantages for miniature luminescent diodes in which the leadframe has footprint dimensions of approximately 0.5 mm × 1.0 mm or less, in particular in the case of luminescent diodes which have a component height of approximately 400 µm or less, preferably of approximately 350 µm or less.

On page 4, amend the paragraph beginning on line 2, as follows:

Apart from the stated advantages, luminescent diodes of the type described above offer a low thermal resistance R_{th} , so that a high power dissipation is possible because ~~on account~~ of the good heat removal. The described construction also allows very flexible designs with a plurality of chips (multichip designs) to be realized in a confined space.

On page 4, amend the paragraph beginning on line 10 as follows:

~~According to the invention, the~~ Another aspect of the present invention is directed to a method for producing a surface-mountable luminescent diode which comprises the method steps of:

- providing a leadframe which is a flexible multi-layered sheet which has at least one first chip connection region and at least one second chip connection region;
- providing at least one semiconductor chip, which contains an active, radiation-emitting and/or radiation-receiving region and has a first contact area and a second contact area;
- mounting the semiconductor chip with the first contact area on the first chip connection region of the leadframe;
- connecting the second contact area to the second chip connection region of the leadframe; and
- ~~– producing an encapsulation for the semiconductor chip by casting, injection molding, transfer molding extruding or extrusion coating (referred to hereafter collectively as~~

~~"encapsulating")~~ encapsulating the semiconductor chip with ~~encapsulating material,~~
~~which is permeable to the emitted and/or received radiation, in particular with~~
~~correspondingly a transparent or translucent polymer~~ encapsulating material.

On page 6, amend the paragraphs beginning on lines 4 and 10 as follows:

The use of the flexible leadframe material allows ~~all the~~ process steps of the method according to the invention to be carried out reel-to-reel (from a payoff reel to a takeup reel), which minimizes the handling effort in production.

In addition, with the concept described there is the possibility of dispensing with the taping of the components (a "tape" is the package on which the LED components are delivered to customers). If desired, a plurality of components that belong together can, after a chip test, be delivered on the flexible frame (thus dispensing with the need for tape) together with a wafer map (a "wafer map" contains the measured parameters for each chip on the wafer). Alternatively, after the chip test, the components can be singularized, taped and delivered.

On page 6, delete the paragraphs beginning on lines 19 and 24 in their entirety.

On page 6, before line 32, insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 6, amend the paragraph beginning on line 32 as follows:

Figure 1 shows a schematic sectional view of the exemplary embodiment taken along line I-I in Figure 2; and

On page 6, amend the paragraph beginning on line 35 as follows:

Figure 2 shows a perspective view of the exemplary embodiment from Figure 1 in an exploded representation (without bonding wire 28).

On page 7, before line 2, insert the following heading:

DETAILED DESCRIPTION OF THE DRAWINGS

On page 8, add the following as the last paragraph:

The scope of protection of the invention is not limited to the examples given hereinabove. The invention is embodied in each novel characteristic and each combination of characteristics, which includes every combination of any features which are stated in the claims, even if this combination of features is not explicitly stated in the claims.